

# Outline for Models-3 User Manual

## Chapter 1.0 Introduction to Models-3

- Getting Started with Models-3
  - - Applications - science supported - change model domain
  - - Model building - community concept, interchangeable science components
- System requirements
  - - Hardware
  - - Software
- Installing Models-3
  - - Brief overview
  - - Need for system administrator
  - - Reference, installation manual
- Start-up
- Exiting the system
- What to do next
  - - User's role (focus), use of study planner and strategy manager
  - - Model developer's role, use of model builder and source code manager
  - - Visualization and Analysis Capabilities
  - - About This User Manual

## Chapter 2.0 Introducing the Framework

- Overview of Models-3
  - Models-3 Subsystems
  - I/O API, Conforming and Nonconforming programs, and Global Objects
  - How Models-3 Will Help You
    - Model User--preparing input data (emission, meta, other), executing models for small or large applications, analyzing model results.
    - Model Builder--improving and evaluating model components, comparing alternative models, updating a photochemical mechanism implementation.
- Models-3 Main Menu
  - Understanding the Tool Bar
  - Choosing Commands from the Menu Bar
- Working with Models-3 Features
  - Screen Features
    - Action Buttons
    - Control Block
- Working with Models-3 Windows
  - Common Pop-up Windows
  - Options and Preferences
- Using On-line Help
  - Help Browser Window
  - Table of Contents Window
  - Search Window
  - Bookmarks Window

- Pop-up Window
- Preference Window
- Help Context
- Exiting On-line Help

### Chapter 3.0 Managing and Defining Datasets and Dataset Files

- Registering data
  - - Import, export, meta data (required, optional)
- Searching for data
  - - Browsers, key words, data types
- Manipulating Data
  - - Open copy, move, delete, edit, view, visualize
- Archiving and Restoring Datasets
- Data Directory Structure
- Moving Data Across Platforms
- Attributes of Models-3 conforming datasets
- Automatic File Naming Conventions

### Chapter 4.0 Preparing and Executing Study Plans (Build Manager is in Chapter 9)

- Case Definition

### Chapter 5.0 Managing Programs

- Registering Data
- Searching for Data
- Example of Editing Source Code

### Chapter 6.0 Developing Emission Control Strategies

- Models-3 Emission Processor Background
  - Background Discussion
    - - Overview of emission inventory processing for chemical transport modeling, Emission data needs of CTM (brief and general), Traditional source of emission data for modeling, Traditional preparation of emission data for use in a CTM (general)
    - - Function and place of the emission processor in the Models-3 framework, Role of emission processor in Models-3 context. (Module in framework, ultimately object-oriented, multi-pollutant, flexible use in strategy building/scenarios, ease of use) (show functional location in system), Linkage of an emission processor in the Models-3 framework (software linkages)
    - - Reasons for selection of EMPRO/EMS-95 as basis of the IOV emission system, Description and comparison of available emission processing tools, Selection of EMPRO as a starting point for the IOV and limitations, Key Emission processing functions for the IOV

- Models3 Emission Processing and Projection System (MEPPS)
  - General overview of MEPPS system structure and functionality
  - Input Processor (INPRO)
    - General overview of INPRO
      - Creation of MEPPS directory structures (Session)
      - Emission and meteorological data preprocessing (INPRO)
        - Preprocessing of the inventoried emissions
        - Preprocessing of the meteorological data
  - Emission Processor (EMPRO)
    - General overview of EMPRO
      - Creating and executing EMPRO cases (Session)
      - Creating grids (Grid)
      - EMPRO models (Models): Point Source, Area Source, Biogenic Source, Mobile Source
      - Chemical Speciation
      - Chemical Mechanisms: CBIV, RADM2, SAPRC, Generic
      - Speciation Processor
    - Visualization with GIS (Visualize):
      - Themes symbology and visualization of the emissions
      - Query, multi-bar displays, feature identification, and variable setup
      - Sub-study setup
  - Output Processor (OUTPRO)
    - General overview of OUTPRO and emission interface to Plume-rise and CTM
      - - Creating reports and ranking
      - - Generating the SCC/Tier-based reports and ranking
      - - creating stack files, temporalized and speciated emission files
- Emission, Control Projections (Scenarios)
  - Overview and Linkage to emission processing
  - Introduction
    - - Opening the EPA Emissions Projection Module
    - - Closing the EPA Emissions Projection Module
    - - Modes of Operation
  - Interactive Mode
    - - Overview
    - - Screen-Specific Instructions
  - Batch Mode
    - - Creating Criteria Sets
    - - Browsing Current Criteria Sets
    - - Running Batches
    - - Browsing Completed Criteria Sets
    - - Batch Output
  - Output
    - - Output Selections
    - - Viewing Reports to the Screen
    - - Graph Type
    - - Viewing Graphs
  - Importing Files

## Chapter 7.0 Visualization and Analysis Tools

- VIS5-D
- Pave
- Data Explorer
  - - Comparison of Model predictions and aircraft data
  - - Integrate Reaction Rate and Mass Balance Process Analysis
- SAS
- Text Editor
- Statistical Analysis
- Developing Long-term Averages-aggregation

## Chapter 8.0 Building Model

- Specifying Common Modeling data in Science Manager
- Selecting Science Modules and Compile Parameters in Build Manager

## Chapter 9.0 System Administration

- Tutorials
  - Model User
  - Model Builder
- Appendices
  - Glossary
  - Acronyms
  - Field Descriptions
  - Data Sources
  - Cross-References (Index?)
  - Quick Reference
  - Vis5D Version 4.2
  - Pave User Guide Version 1.4
  - Control Equipment Codes